

What are Visible Emissions?

A wide range of industries produce visible emissions (VE). They are introduced into the atmosphere by sources such as stacks, vents and conveyor lines.

Visible emissions are comprised of a variety of particulate matter (PM) ranging in sizes from 0.1 micrometer (μm) to 200 μm (compared to the average human hair, which is 70 micrometers in diameter).

Particles are categorized as:

- Smoke
- Dust
- Fumes
- Soot
- Fly Ash
- Liquid Droplets

Particles also are formed in the atmosphere by condensation or transformation of emitted gases, such as sulfur dioxide, nitrogen oxides and volatile organic compounds, into tiny droplets.

Inhaled Particles Can Be Hazardous to Your Health

Smoke and dust are the most common types of visible emissions. They are comprised of inhalable particulate matter made up of microscopic solid or liquid particles. Major human health concerns include effects on breathing and respiratory functions, aggravation of existing respiratory and cardiovascular disease, alterations in the body's defense systems against foreign materials, damage to lung tissue, carcinogenesis and premature death.

Particulate matter also may injure crops, trees and shrubs, and may damage metal surfaces, fabrics, etc. Fine particles also impair visibility by scattering light and reducing the visual range in urban, rural and wilderness areas.

This brochure provides a summary of visible emissions requirements and is not intended to be all-inclusive. Detailed requirements are outlined in DEQ's Rules for the Control of Air Pollution in Idaho (IDAPA 58.01.01.625).

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Air Quality in Idaho: Measuring Visible Emissions at Your Facility



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How Are Visible Emissions Measured?

The Ringelmann Chart was developed in the late 1800s and became one of the first tools used to measure visible emissions. Introduced into the United States in 1897, it was soon accepted as the standard measure of black smoke density and later adapted for gray, white and other colors of smoke plumes. This then became the basis for many city, state, and federal regulations on smoke density limitations. The Ringelmann Chart is based on the premise that the darker the plume, the more particles are present to block the light and reduce visibility.

Plume opacity is measured in percent: the greater the opacity, the more the background behind the plume is obscured and the less light can come through the plume. If none of the background is obscured, then the opacity is 0%. If the entire background is obscured, then the opacity is 100%.

EPA Reference Method 9

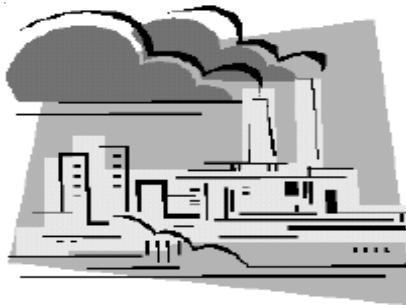
EPA Reference Method 9 is found in 40 CFR Part 60, Appendix A. It was adopted as a visible emissions inspection method in an effort to standardize the training and certification of observers and to ensure that reliable and repeatable opacity observations could be conducted anywhere in the United States.

Idaho Visible Emissions Limit

Idaho's methods for determining opacity are found in the Department of Environmental Quality (DEQ) Procedures Manual for Air Pollution Control (1986). These procedures are nearly identical to those contained in EPA Reference Method 9. Both describe the requirements for training and testing of opacity observers, steps to follow and data to record while documenting an observation.

The major difference between Idaho's method for making opacity determinations and Method 9 is how opacity exceedances are calculated. In Idaho, visible emissions from any point of emission cannot exceed 20% opacity for more than three minutes in any 60-minute period. *Rules for Control of Air Pollution in Idaho*, IDAPA 58.01.01.625.

(Different standards apply to six exempted sources. See the rules for more information about these sources. Additionally, more stringent visible emissions standards may apply to sources subject to Federal New Source Performance Standards found in 40 CFR Part 60.)



VE Observer Training

Each spring and fall, EPA-certified Visible Emission Evaluation (VEE) training and certification is offered in Boise and Coeur d'Alene to state and industry personnel in a three-day course provided by Eastern Technical Associates (ETA). As a "smoke reader," a person is required by Method 9 and state policy to recertify every six months. For more information about this training, contact ETA at (919) 878-3188 or at www.eta-is-opacity.com or contact DEQ's Air Quality Division at (208) 373-0502.

What Constitutes a Visible Emissions Violation in Idaho?

To determine compliance with the Idaho visible emissions standard, calculate opacity as follows:

- Step 1:** Count the number of readings in excess of the percent opacity limitation (in most cases, 20%).
- Step 2:** Divide this number by four (each reading represents 15 seconds) to find the number of minutes in excess of the percent opacity limitation.
- Step 3:** If the opacity limit has not been exceeded for more than three minutes, no violation has occurred.

Exceptions

Because Method 9 calculates opacity differently than the Idaho rule, sources subject to federal New Source Performance Standards must calculate opacity as described above **and** as specified in Method 9.

According to Method 9, a violation has occurred if the **average of any group of 24 consecutive readings** (six minutes) in a one-hour period exceeds the standard.

Consequences of Non-compliance

Failure to comply with the visible emissions standard may result in enforcement action by DEQ with possible penalties assessed.

Questions?

For further information and tools on how to comply:

- Contact DEQ's Air Quality Division at 208/373-0502.
- Visit DEQ's Web site at http://www.deq.idaho.gov/air/prog_issues/pollutants/visible.cfm

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